

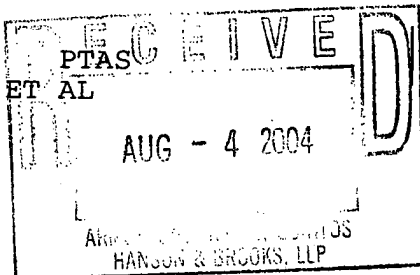


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JULY 29, 2004

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ASSIGNOR:

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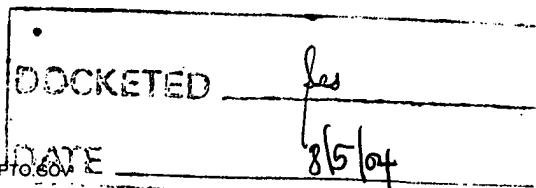
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TOKYO 153-8665, JAPAN

SERIAL NUMBER: 10760363

FILING DATE: 01/21/2004

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ISSUE DATE:

TITLE: DATA STRUCTURE OF FEATURE GUIDANCE INFORMATION, RECORDING MEDIUM
STORING FEATURE GUIDANCE INFORMATION, NAVIGATION DEVICE, NAVIGATION
SYSTEM, NAVIGATION METHOD, NAVIGATION PROGRAM AND RECORDING MEDIUM
STORING THE NAVIGATION PROGRAM

014914/0024 PAGE 2

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01-28-2004

Attorney Docket No. 040012

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Execution Date

First party Name: MIYAHARA, Hiroshi

January 14, 2004

Second party Name:

Third party Name:

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Additional name(s) of conveying party(ies) attached? Yes ☐ No ☒

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If this document is being filed together with a new application, enter the date the application was signed by the first named executing inventor: January 14, 2004

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31,898

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US007451040B2

(12) **United States Patent**
Miyahara

(10) **Patent No.:** **US 7,451,040 B2**
(45) **Date of Patent:** **Nov. 11, 2008**

(54) **DATA STRUCTURE OF FEATURE GUIDANCE INFORMATION, RECORDING MEDIUM STORING FEATURE GUIDANCE INFORMATION, NAVIGATION DEVICE, NAVIGATION SYSTEM, NAVIGATION METHOD, NAVIGATION PROGRAM AND RECORDING MEDIUM STORING THE NAVIGATION PROGRAM**

6,023,655 A * 2/2000 Nomura 701/208
6,035,253 A * 3/2000 Hayashi et al. 701/211
6,144,318 A * 11/2000 Hayashi et al. 340/995.19
6,157,342 A 12/2000 Okude et al. 342/357

(Continued)

FOREIGN PATENT DOCUMENTS

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EP 0 790 486 A2 8/1997

(73) **Assignee:** **Increment Corporation, Tokyo (JP)**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 123 days.

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G01C 21/26 (2006.01)

(52) **U.S. Cl.** **701/200**

(58) **Field of Classification Search** 701/200-226;
340/998, 990, 995.1-995.28
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,023,798 A * 6/1991 Neukirchner et al. 701/208
5,513,110 A * 4/1996 Fujita et al. 701/207
5,793,310 A * 8/1998 Watanabe et al. 340/995.14
5,845,228 A * 12/1998 Uekawa et al. 701/209
5,948,040 A * 9/1999 DeLoime et al. 701/201
5,978,733 A * 11/1999 Deshimaru et al. 701/209
6,011,494 A * 1/2000 Watanabe et al. 340/995.14

SHOULD READ AS: -- INCREMENT P CORPORATION, TOKYO (JP) --
(Continued)

OTHER PUBLICATIONS

European Search Report of Mar. 3, 2006.

(Continued)

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(57) **ABSTRACT**

A feature guidance information that provides guidance on a feature has a data structure where a unique information representing a feature position and a guidance position are associated with respective sub-areas so that each sub-area includes at most one of the feature and the guidance position to represent the feature or the guidance position. When it is recognized that a vehicle reaches a position indicated by the unique mesh information of the guidance position with respect to a current position of the vehicle, guidance on the feature corresponding to the guidance position is provided. Thus, an amount of information, load for sending/receiving data and processing can be largely decreased compared to that coordinates are used for representing the feature position and the guidance position of the feature guidance information, thereby providing smooth navigation.

6 Claims, 10 Drawing Sheets

